



Structural Damage Investigation

March 14, 2014

For: Kingsmill Properties & Management
Bill Kingsmill
1200 N Highway 190
Covington, La. 70433

Ref: 82358 Highway 25
Folsom, LA

Construction:

The subject of this investigation is an existing 7,472 sq. ft. single-story, metal frame building with stucco/vinyl/metal veneers and metal roof on a conventional concrete foundation, is approximately 30 years old, and consisting of a gas station with a convince store with three other tenants. The building was not provided throughout with an automatic sprinkler system.

Scope:

This report is limited to a visual investigation of the building shell, including the interior and exterior concrete foundation. No investigation of the mechanical or electrical systems was performed. This report is as outlined by the National Academy of Building Inspection Engineers Standards and Practices for Small Building Property Condition Surveys. This report is not an explanation of cause, effect, or engineering.

History:

Bill Kingsmill of Kingsmill Properties contracted with Dammon Engineering to perform a structural investigation of the referenced building to determine the possible effects of fire on the existing structural systems in the damaged south end of the building.

This inspection is limited to the apparent visual conditions of the structural components of this building. It does not cover, nor attempts to cover, any components, items, and/or conditions which, by their nature or location, are concealed or are difficult or hazardous to inspect, or which require the moving of furniture, flooring materials, rugs, fixtures, appliances, or any component-part nailed, bolted, or screwed down or shut. No opinions are expressed regarding conditions which could be discovered only by the disassembly of any component parts, special testing, or removal of any concealing objects.

Inspections are made under normal weather conditions, and are not opinions of the conditions of the property and/or structure which may exist under unusual weather conditions, such as, but not limited to floods, heavy rains or snows, high winds, temperature extremes, or any act of God. Specific hazardous wastes, toxic substances, toxic mold, air and water quality, communicable diseases, asbestos, soil, environmental, radon, carbon monoxide, formaldehyde, building code and termite conditions are not included in this report unless otherwise stipulated.

This report is not a warranty or guarantee of the property inspected, but it is our opinion of its condition at the time inspected. Our liability shall be limited to reimbursement of the total cost of inspection.

Findings:

The fire started in the kitchen area of the gas station and damaged the suspended ceiling system, including the electrical, lighting, and plumbing systems above. As a result of the collapse of the ceiling system, fire and smoke spread to the plenum space and exposed the roof and roof framing (including the roof panels, girts, and structural steel frames) to the intense heat of the fire. The other tenant spaces appeared to have smoke damage only.

Analysis:

The load bearing capacity of carbon steel can be adversely affected by fires that reach 300°C (see attached studies "Carbon Steel Mechanical Properties" and "The Effects of Fire on Structural Systems"). Being that the fire began in the kitchen area and the tenant advertised fried chicken, it is safe to conclude that cooking oil was the source of ignition. Studies have indicated that auto-ignition of cooking oils can range from 400°C to 435°C (see attached study "Auto-Ignition of Cooking Oils"). Further, some adjacent structural members showed signs of deformation, where no visual signs of deformation were evident on the larger steel frames; the same temperature range would have been present.

Conclusion:

The structural system in the vicinity of the fire (including both primary and secondary framing members) has been structurally compromised as a result of exposure to fire and that they should be replaced with new construction. This is based on our visual investigation and studies on the effects of fire on structural steel and commercial kitchen fires.

There is no reason to believe the structural framing outside the tenant space that was directly impacted by the fire has been compromised.

We recommend that all fire-damaged debris and flooring be removed from the area impacted by the fire to allow a more thorough investigation of the foundation. However research has found that intense heat from fires can compromise structural concrete via thermal cracks and spalling (see attached study "Thermal Cracking of Concrete" by the NRMCA).

It is recommended that all the damaged steel structure in that study area be replaced for safety of the general public.

Sincerely,



Kevin J. Kinchen, NCARB
Chief Architect
Dammon Engineering

Enclosures: Site photos, studies: "Carbon Steel Mechanical Properties", "The Effects of Fire on Structural Systems", "Auto-Ignition of Cooking Oils", and "Thermal Cracking of Concrete"

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